

Using ICC profiles with Video in Apple QuickTime

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Goals and Objectives of Color Managing Video

- ◆ Color manage video files for diverse distribution campaigns
- ◆ Using Apple's Colorsync and QuickTime technologies on the Macintosh to color match video
- ◆ Eliminate color distortions in each delivery method by understanding the limitations
- ◆ Color balance video cameras in multiple camera shoots using input profiles

Color Managing Video Today

- ◆ Limited support of the QuickTime effects/filters architecture from video editing programs.
- ◆ Colorsync v3 does not support the .mov (QuickTime Movie) file for on-the-fly color matching.
- ◆ Currently, no video editing software supports an editing color space. A monitor profile can not be integrated within video editing software.
- ◆ All color matching with video files must be done on a clip by clip basis

Distributing Video in the next century

- ◆ Video will be distributed and viewed on devices other than traditional SDTV (standard definition television)
- ◆ DVD-ROM/CD-ROM/Intra-nets/Internet/HDTV
- ◆ NTSC (1951) -vs.....- SMPTE-C (1980)
- ◆ sRGB/HDTV

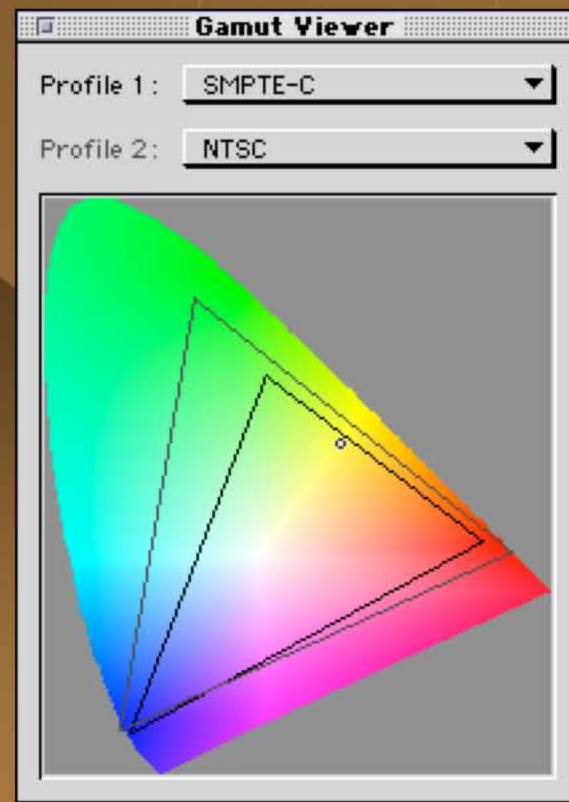
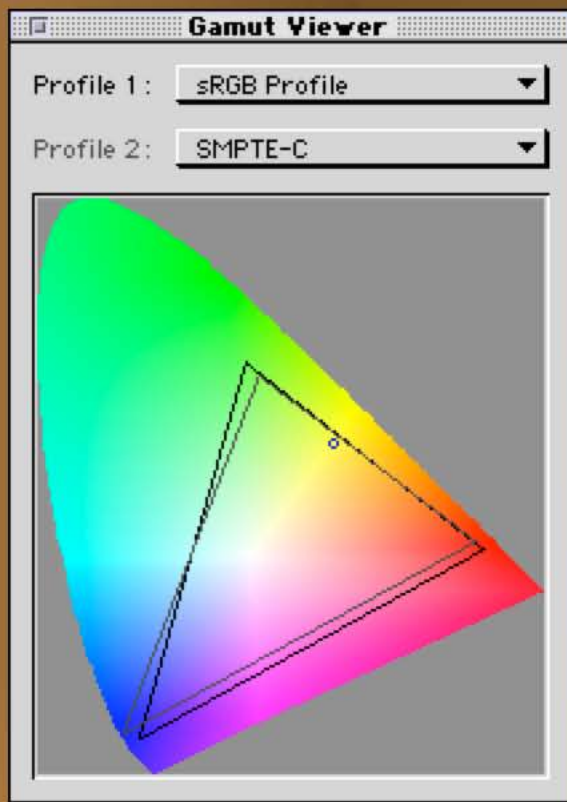
sRGB Specification & HDTV

The image shows a screenshot of a software dialog box titled "RGB Setup". The dialog box contains several configuration options:

- RGB:** A dropdown menu set to "sRGB".
- Gamma:** A text input field containing the value "2.20".
- White Point:** A dropdown menu set to "6500°K (D65)".
- Primaries:** A dropdown menu set to "HDTV (CCIR 709)".
- Monitor:** A text field containing "Viewsonic Dan".
- Display Using Monitor Compensation**

On the right side of the dialog box, there are five buttons: "OK", "Cancel", "Load...", "Save...", and a checked checkbox labeled "Preview".

Color Gamuts of Destination ICC Profiles



Apple QuickTime™ & Colorsync™

- ◆ Version 3 release of QuickTime includes a Colorsync *filter*.
- ◆ Version 4 of QuickTime allows a rendering intent to be chosen. The Colorsync control panel CMM tab determines which CMM is used in the conversion.
- ◆ The Colorsync filter is available in the Pro version of QuickTime and applications that support the QuickTime Effects/Filter architecture.

Applications that support the Macintosh QuickTime Effects Architecture

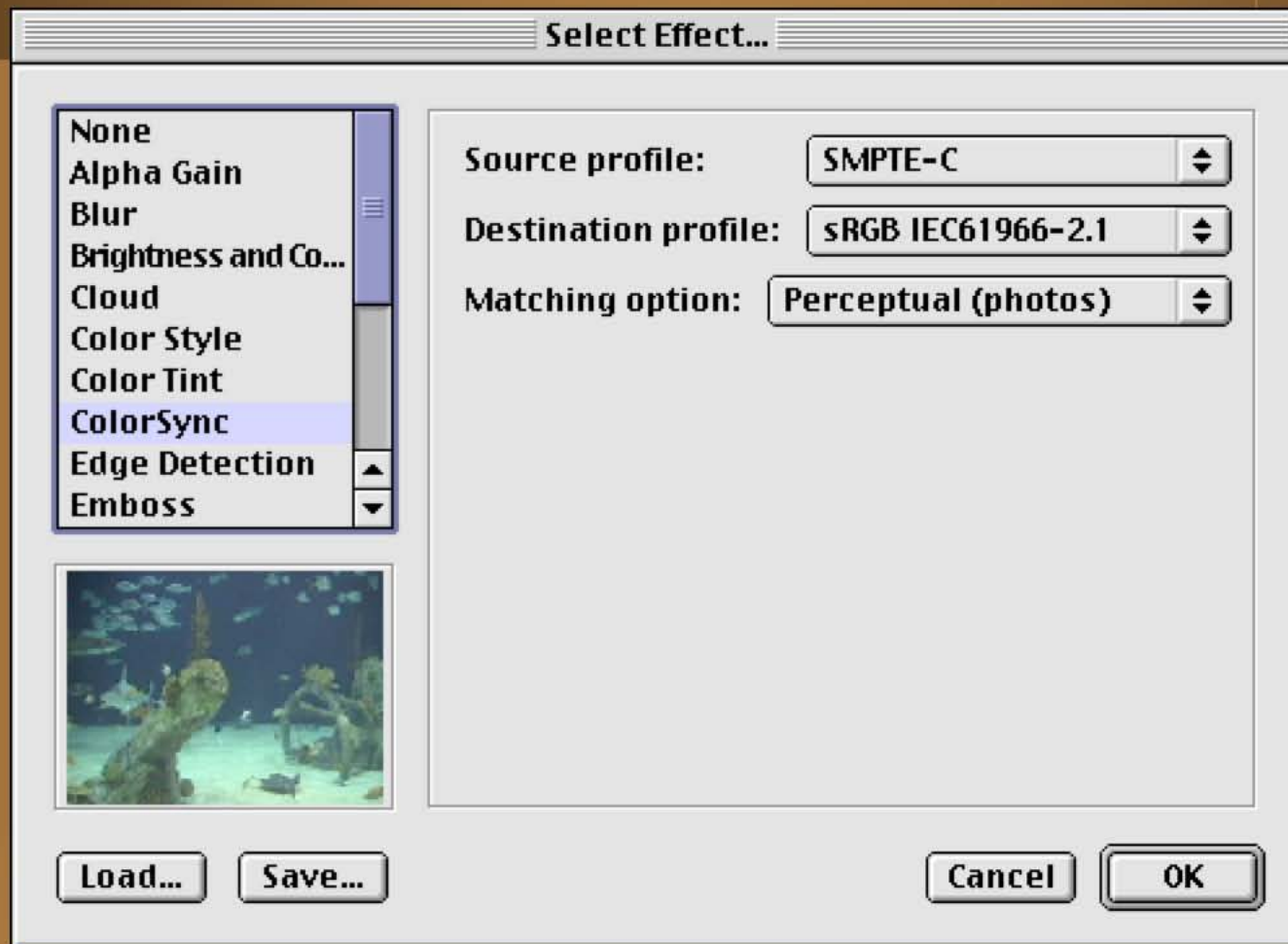
- ◆ Adobe Premiere v5.1a
- ◆ Adobe After Effects v4.1
- ◆ Apple Final Cut Pro v1.x
- ◆ Terran Interactive Media Cleaner Pro v3.x

Color Managed Video

Raw (SMPTE-C) | Converted (sRGB)

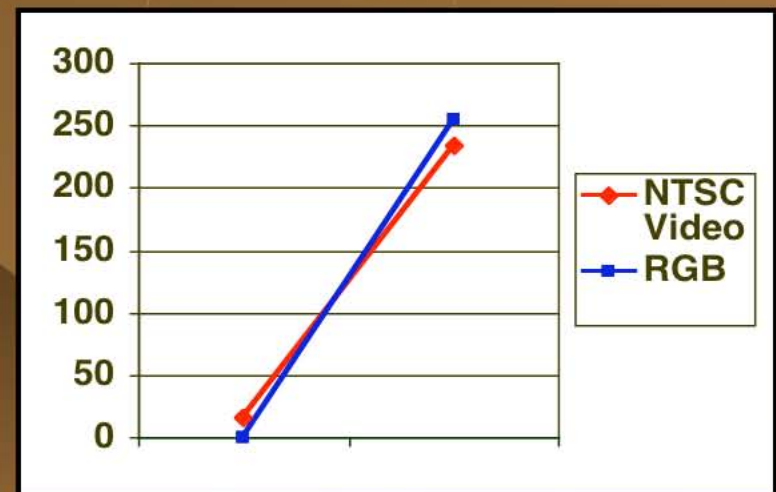
(click image to play movie)

QuickTime 4 Colorsync Filter



NTSC Video - vs. - RGB

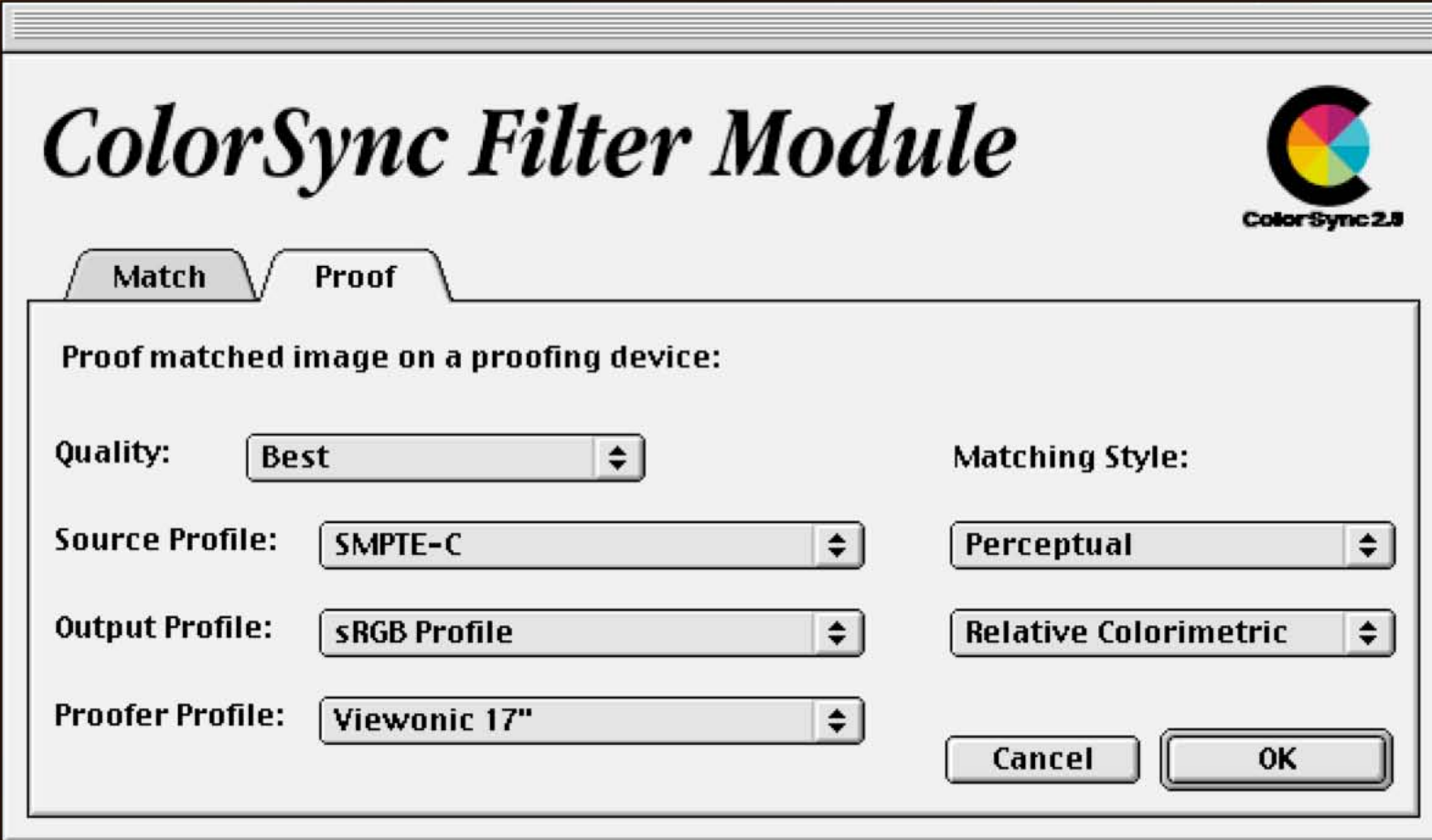
- ◆ NTSC Video records in a compressed color format of YUV (similar to PhotoCD)
- ◆ Video uses a non binary system. Video is recorded with a numerical scale of 16 - 235. 8bit RGB files use 0 - 255 ($2^8=256$)
- ◆ Depending on which video CODEC used in acquisition will determine what color space is used. (RGB or YUV)



Soft proofing Video Output with the Colorsync Photoshop Filter

- ◆ Applications that support the Adobe Photoshop plug-in architecture can use the Colorsync Filter to soft proof tonal adjustments during editing
- ◆ The Colorsync filter allows for soft proofing on the computer display while the QuickTime Colorsync filter only allows for output targeting.

Colorsync Photoshop Filter: Soft proofing the Color Conversion



ColorSync Filter Module

ColorSync 2.0

Match **Proof**

Proof matched image on a proofing device:

Quality:

Source Profile:

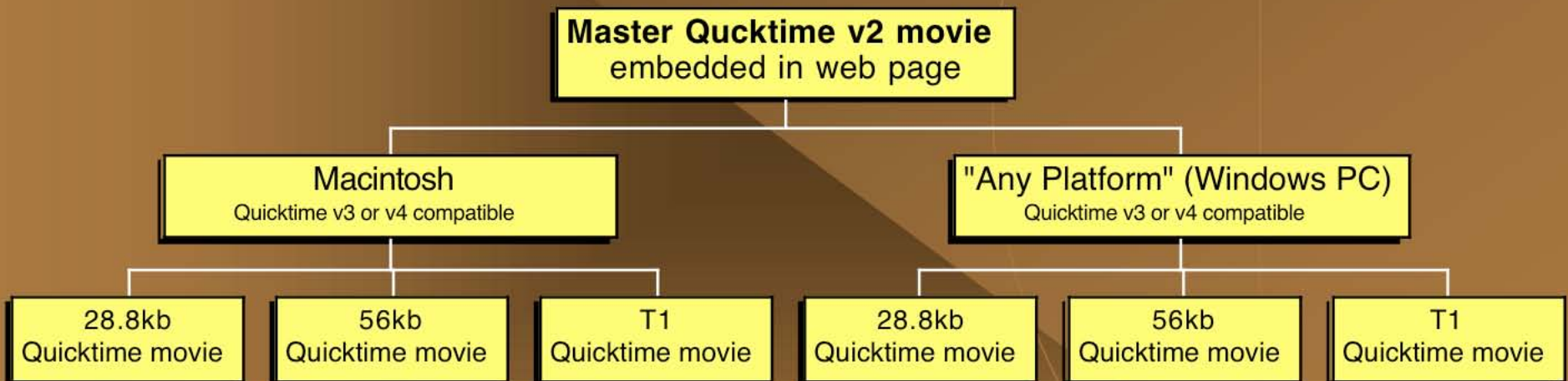
Output Profile:

Proofer Profile:

Matching Style:

The image shows a screenshot of the 'ColorSync Filter Module' dialog box in Adobe Photoshop. The dialog has a title bar and a main content area. At the top left, the title 'ColorSync Filter Module' is displayed in a large, bold, black serif font. To the right of the title is the ColorSync 2.0 logo, which consists of a stylized 'C' made of four colored segments (red, yellow, cyan, magenta) and the text 'ColorSync 2.0' below it. Below the title and logo are two tabs: 'Match' and 'Proof'. The 'Proof' tab is currently selected. The main content area is titled 'Proof matched image on a proofing device:'. It contains several settings: 'Quality' is set to 'Best'; 'Source Profile' is set to 'SMPTE-C'; 'Output Profile' is set to 'sRGB Profile'; 'Proofer Profile' is set to 'Viewonic 17'; 'Matching Style' is set to 'Perceptual'; and 'Relative Colorimetric' is also visible. At the bottom right of the dialog are two buttons: 'Cancel' and 'OK'.

QuickTime v3 & v4 : Scalability on the Internet



Dan's Wish List

- ◆ Greater acceptance and support from the video industry for a color managed workflow
- ◆ Support of the .mov file under the Colorsync API
- ◆ On-the-fly color matching of QuickTime movie files tagged with an ICC profile

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